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EXAMINER	
CAILLOUET, CHRISTOPHER C	
ART UNIT	PAPER NUMBER
1791	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,215	HERMKENS ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER C. CAILLOUET	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Examiner: Caillouet April 8, 2009

METHOD FOR MANUFACTURING A MIDPLANE

DETAILED ACTION

1. The Amendment filed on January 28, 2009 has been entered. Claims 3-4 and 7-10 have been amended.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

3. Claims 1-3 are rejected under 35 U.S.C. 102(a) as being anticipated by Shi et al. (US 20030034174).

Shi et al. (Shi) discloses a method of making a circuit board. Shi discloses that a multilayer board (12) having a connection assembly is bonded to layers (60, 62) of conductive material (Figure 1d; paragraphs 34). Shi discloses that a portion of the layer is removed exposing the connection assembly, thereby forming a channel in said layer, (38 & 40) of the multi-layer board (paragraph 36).

As to claim 2, Shi discloses that a space (38 & 40) is formed between the layer and the connection assembly of the multi-layer board (Figure 1d).

As to claim 3, Shi discloses that the layers (60, 62) are in the form of a conductive metallic foil (paragraph 34). Shi further discloses that a dielectric adhesive layer (18, 20) is provided to bond the conductive layers to the multilayer board (Fig. 1B; paragraph 24), therefore providing a dielectric layer and conductive layer connected to the multi-layer board.

Furthermore, if it were claimed that the conductive layer and the dielectric layer were bonded in a step prior to connection to the multilayer board, such a step would have been obvious to one of ordinary skill in the art at the time of the invention for the following reasons. Shi discloses that the dielectric adhesive layers (18, 20) are disposed on the multilayer board, but fails to disclose whether said adhesives may be disposed on the conductive layers (60, 62). It is the position of the examiner that it is well known in the art that in order to bond two surfaces together with an adhesive, adhesive may be applied to either or both surfaces to be bonded. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to that the dielectric adhesive could be applied to the conductive layers instead of the multilayer board in order to form a bond between the conductive layers and said board.

Claim Rejections - 35 USC § 103

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 20030034174) as applied to claims 1-3 above.

As to claim 4, the method of claim 3 is taught as seen above. Shi discloses that the conductive metallic layers attached to the multilayer board are made of aluminum, but is silent as to whether they may comprise of copper clad laminate with copper only on one side. Shi discloses that other conductive layers in the multilayer board may comprise of copper (paragraph 34). It would have been obvious to one of ordinary skill in the art that copper clad layers could be used instead of aluminum because like the aluminum layers, the copper clad layers are electrically conductive.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a copper layer instead of an aluminum layer because one of ordinary skill in the art would have been able to carry out such a substitution to achieve the predictable result of forming a multilayer board with conductive layers applied thereon. "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 82 USPQ2d 1385 (2007).

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 20030034174) as applied to claim 1 above, and further in view of Selk et al. (US 5677515).

The method of claim 1 is taught as seen above. Shi fails to disclose whether depth controlled routing may be used to remove portions of the conductive layer and expose the connector areas (38 & 40). It is the position of the examiner that it is well known in the art to use depth controlled routing to remove areas and form channels on multilayer boards. Selk et al. (Selk) discloses a method of forming a multilayer wiring board (Abstract). Selk discloses that a routing machine can be used to rout a channel or a groove through the upper layers of a multilayer wiring board (column 3, lines 7-14). It would have been obvious to one of ordinary skill in the art at the time of the invention that a known successful method of forming channels in a multilayer wiring board, such as depth controlled routing as taught by Selk, could be used in the method of Shi to remove portions of the metallic conductive layer to expose the connector areas.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 20030034174) as applied to claim 1 above, and further in view of Ryan (US 3756891).

Shi fails to disclose whether the multi-layer board (12) may be coated with a material prior to attaching the conductive layers (60, 62), but does disclose that the apertures (38 & 40) are electroplated with an electrically conductive material (98) (paragraph 39). Absent unexpected results, it would have been obvious to one of ordinary skill in the art to apply an electrically conductive coating to the multi-layer board prior to attaching the conductive layers (60, 62). Ryan discloses a method of making a multilayer circuit board (Abstract). Ryan discloses that a thin conductive layer (14) may be applied to a base substrate (10) that will make the substrate receptive to subsequent electroplating (column 3, lines 30-41). It would have been obvious to one of ordinary skill in the art to incorporate the method of Ryan into the method of Shi and would have been motivated to do because Ryan teaches that by coating the base substrate with a thin conductive layer to make it receptive to subsequent electroplating.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the method of Ryan in the method taught by Shi because one of ordinary skill in the art would have been able to carry out such a substitution to achieve the predictable result of making a surface more receptive to the electroplating step in the method of Shi. "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 82 USPQ2d 1385 (2007).

7. Claim 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 20030034174) in view of Kim et al. (US 20010027875).

As to claim 7, Shi et al. (Shi) discloses a method of making a circuit board. Shi discloses that a multilayer board (12) having a connection assembly is bonded to a layer (60, 62) of material (Figure 1d; paragraphs 34). Shi discloses that a portion of the layer is removed exposing the connection assembly (38 & 40) of the multi-layer board (paragraph 36). Shi is silent as to whether multiple multilayer components may be used in manufacturing the mid-plane. It is the position of the examiner that it is well known in the art to attach multiple multilayer components to form a midplane, and would have been obvious to one of ordinary skill in the art. Kim et al. (Kim) discloses a method of manufacturing a multilayer circuit board (Abstract). Kim discloses that two multilayer components (67a, 67b) are affixed to one another to form a circuit board (Fig. 7A & 7B; paragraphs 112-114). It would have been obvious to one of ordinary skill in the art to incorporate a known successful method of forming a multilayer circuit board from two multilayer components, as taught by Kim, into the method of Shi and would have been motivated to do so because it would allow the structure to have active connector regions on both sides of the mid-plane, therefore saving space.

Absent unexpected results, it would have been obvious to one of ordinary skill in the art that the method of Shi could be used on two multilayer boards to be attached to each other, forming a structure with openings exposing connector areas on both side of the composite.

As to claim 8, Shi discloses that a space (38 & 40) is formed between the layer and the connection assembly of the multi-layer board (Figure 1d).

As to claim 9, Shi discloses that the layers (60, 62) are in the form of a conductive metallic foil (paragraph 34).

As to claim 10, the method of claim 9 is taught as seen above. Shi discloses that the conductive metallic layers attached to the multilayer board are made of aluminum, but is silent as to whether they may comprise of copper clad laminate with copper only on one side. Shi discloses that other conductive layers in the multilayer board may comprise of copper (paragraph 34). It would have been obvious to one of ordinary skill in the art that copper clad layers could be used instead of aluminum because like the aluminum layers, the copper clad layers are electrically conductive.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a copper layer instead of an aluminum layer because one of ordinary skill in the art would have been able to carry out such a substitution to achieve the predictable result of forming a multilayer board with conductive layers applied thereon. "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 82 USPQ2d 1385 (2007).

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 20030034174) in view of Kim et al. (US 20010027875) as applied to claim 7 above, and further in view of Selk et al. (US 5677515).

The method of claim 7 is taught as seen above. Shi fails to disclose whether depth controlled routing may be used to remove portions of the conductive layer and expose the connector areas (38 & 40). It is the position of the examiner that it is well known in the art to use depth controlled routing to remove areas and form channels on multilayer boards. Selk et al. (Selk) discloses a method of forming a multilayer wiring board (Abstract). Selk discloses that a routing machine can be used to rout a channel or a groove through the upper layers of a multilayer wiring board (column 3, lines 7-14). It would have been obvious to one of ordinary skill in the art at the time of the invention that a known successful method of forming channels in a multilayer wiring board, such as depth controlled routing as taught by Selk, could be used in the method of Shi to remove portions of the metallic conductive layer to expose the connector areas.

9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 20030034174) in view of Kim et al. (US 20010027875) as applied to claim 7 above, and further in view of Ryan (US 3756891).

Shi fails to disclose whether the multi-layer board (12) may be coated with a material prior to attaching the conductive layers (60, 62), but does disclose that the apertures (38 & 40) are electroplated with an electrically conductive material (98) (paragraph 39). Absent unexpected results, it would have been obvious to one of ordinary skill in the art to apply an electrically conductive coating to the multi-layer board prior to attaching the conductive layers (60, 62). Ryan discloses a method of making a multilayer circuit board (Abstract). Ryan discloses that a thin conductive layer (14) may be applied to a base substrate (10) that will make the substrate receptive to subsequent

electroplating (column 3, lines 30-41). It would have been obvious to one of ordinary skill in the art to incorporate the method of Ryan into the method of Shi and would have been motivated to do because Ryan teaches that by coating the base substrate with a thin conductive layer to make it receptive to subsequent electroplating.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the method of Ryan in the method taught by Shi because one of ordinary skill in the art would have been able to carry out such a substitution to achieve the predictable result of making a surface more receptive to the electroplating step in the method of Shi. "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 82 USPQ2d 1385 (2007).

Response to Arguments

10. Applicant's arguments filed January 28, 2009 have been fully considered but they are not persuasive.

Applicant argues on page 6 of the Remarks that Shi fails to disclose a provision of a layer having a channel and therefore does not qualify as a 102(b) prior art reference. As stated in the rejection above Shi discloses that a portion of the layer is removed, therefore forming a channel in the layer, thus exposing the connection assembly (38 & 40) of the multi-layer board (paragraph 36).

.Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER C. CAILLOUET whose telephone number is (571)270-3968. The examiner can normally be reached on Monday - Thursday; 9:30am-4:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Phillip Tucker can be reached on (571) 272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher C Caillouet/
Examiner, Art Unit 1791

/Mark A Osele/
Primary Examiner, Art Unit 1791
April 9, 2009